

What is claimed is:

1. A control mechanism for a surgical instrument, comprising:
a structure having a first surface and a second surface;
a flexure mechanism connected to the first surface, the flexure mechanism having a shortened configuration and a lengthened configuration;
a control rod connected to the flexure mechanism;
a compressor having a channel for moving the flexure mechanism between the shortened configuration and the lengthened configuration; and
at least one spring disposed between the flexure mechanism and the second surface.
2. The mechanism of claim 1, comprising an actuator slidably connected to the compressor for moving the compressor relative to the flexure mechanism.
3. The mechanism of claim 1, wherein the structure is a housing.
4. The mechanism of claim 1, wherein the flexure mechanism has a proximal end and the control rod is connected at the proximal end.
5. The mechanism of claim 1, wherein the stiffness of the control rod is controlled by the spring when the flexure mechanism is moved from the shortened position to the lengthened position, and wherein the stiffness of the control rod is controlled by the flexure mechanism when the flexure mechanism is moved from the lengthened position to the shortened position.
6. The mechanism of claim 1, wherein the flexure mechanism is a four-bar linkage.
7. The mechanism of claim 1, wherein the control rod is a cutting blade.
8. The mechanism of claim 1, wherein the control rod controls at least one of a pair of jaws.
9. A control mechanism for a surgical instrument, comprising:
a structure having at least a first surface and a second surface;

a flexure mechanism disposed at least partially within the structure, the flexure mechanism having a shortened position and a lengthened position;
a control rod slidable within the structure;
at least one spring disposed between the flexure mechanism and the second surface;
wherein the flexure mechanism moves the control rod from a first position to a second position when the flexure mechanism moves from the shortened position to the lengthened position.

10. The mechanism of claim 9, wherein the flexure mechanism transmits force to the control rod when the flexure mechanism moves from the intermediate position to the lengthened position.

11. The mechanism of claim 9, wherein the control rod extends outside the structure.

12. A control mechanism for a surgical instrument, comprising:

a structure;
a flexure mechanism retained within the structure, the flexure mechanism having a shortened configuration and a lengthened configuration;
a control rod connected to the flexure mechanism;
a compressor movable between a first position and a second position, the compressor having a surface for moving the flexure mechanism between the shortened configuration and the lengthened configuration when compressor moves between the first position and the second position; and
at least one spring disposed between the flexure mechanism and the structure.

13. A surgical instrument, comprising:

a structure having a first surface and a second surface;
a control mechanism, comprising
a flexure mechanism connected to the first surface, the flexure mechanism having a shortened configuration and a lengthened configuration;
a control rod connected to the flexure mechanism;
a compressor for moving the flexure mechanism between the shortened configuration and the lengthened configuration;

at least one spring disposed between the flexure mechanism and the second surface; and

an end effector attached to the control rod.

14. The surgical instrument of claim 13, wherein the end effector is a clamp that moves between an open position, a closed position and a clamped position.

15. The surgical instrument of claim 14, wherein the compressor moves between an open position, where the at least one spring is in an uncompressed configuration and the flexure mechanism is the shortened configuration, and an intermediate position, where the flexure mechanism is in the lengthened configuration.

16. The surgical instrument of claim 15, wherein the compressor further moves between the open position, the intermediate position, and the closed position, where the at least one spring is in a compressed configuration.

17. The surgical instrument of claim 14, wherein the end effector is in the clamped position when the at least one spring is compressed.

18. The surgical instrument of claim 13, wherein the control rod has a projection and the compressor is configured to contact the projection and thereby move the control rod to the open position when the compressor is moved from the closed position to the open position.

19. A method of controlling an end effector of a surgical device, comprising the steps of:
providing a structure having a first surface and a second surface, a flexure mechanism connected to the first surface, the flexure mechanism having a shortened configuration and a lengthened configuration, a control rod connected to the flexure mechanism, a compressor having a channel for moving the flexure mechanism between the shortened configuration and the lengthened configuration, and at least one spring disposed between the flexure mechanism and the second surface;

moving the compressor relative to the flexure mechanism to cause the control rod to move from a proximal position to an intermediate position;

further moving the compressor relative to the flexure mechanism to move the flexure mechanism from the shortened configuration to the lengthened configuration; and

further moving the compressor relative to the flexure mechanism to compress the at least one spring.